dark green plants of *Melandrium* are *XXZZYYNN*. This was shown by crosses between two light green types, *chlorina* and *pallida*. The F_1 generation was the typical dark green, while the F_2 generation consisted of dark green and light green in the ratio 9:7. Among the light green individuals both *chlorina* and *pallida* plants could be recognized, but just what characters the plants with the formula *XXZZyynn* possessed was not determined.

Three cases of non-mendelizing leaf variegation are also described:

1. This case of variegation was a chimera made up of typical dark green and of pure white areas. Seed from green branches or from white branches produced progeny exactly like the mother, no matter what characters were possessed by the male parent.

2. These plants are called *chlorinomaculata*, because they are dark green spotted with the "chlorina" type of green. The transmission of their characters is not yet entirely clear. The progeny of a female plant crossed with pollen from flowers of different colored branches gave the following results: from variegated branches came green, variegated, and chlorophyll-free plants; from green branches came only green plants; and from *chlorina* branches came only chlorophyll-free plants.

3. These plants were of the yellowish *aurea* type. They were crossed with many other forms, but the results are somewhat complex, and the author does not commit himself definitely on their analysis. He thinks that possibly this may be a case of infectious chlorosis. He says: "While chlorosis of *Abutilon* and other Malvaceae is transmitted neither through the male nor the female gametes, this *aurea* character is carried by a part of the gametes of both kinds." It seems to the reviewer that if this phenomenon is indeed one of infectious chlorosis, the small number of *aurea* plants of the filial generations might easily be due to reinfection.—E. M. EAST.

Statistical methods in phytogeography.—In his attempts to obtain more exact data regarding the distribution of the various elements of alpine flora, JACCARD[10] has developed certain statistical methods that have not only revealed several interesting facts regarding the vegetation of the Alps, but promise to be equally serviceable in the investigation of other areas. Having made a census of the areas to be compared, in this instance similarly situated localities of approximately the same area in various parts of the Alps, he applies for the analysis of his results his *coefficient of community* (C.c.), that is,

$$\frac{\text{No. of species common to two districts} \times 100}{\text{Total no. of species in the two districts}} = \text{C.c.}$$

For alpine meadows at an altitude of 1900 m., several interesting results were manifest, such as: (1) the fact that the value of C.c. does not depend upon floral richness, but upon the ecological characters of the areas studied; (2) the

[10] JACCARD, PAUL, The distribution of the flora in the alpine zone. New Phytol. 11:37–50. 1912.

alpine flora is extremely diverse in floristic composition; (3) the rare species are most numerous and the common species least numerous (this does not apply to number of individuals); and (4) the C.c. is generally higher for contiguous than for distant areas. This last result is strikingly demonstrated in the study of the vegetation upon some alpine gravel areas[11] of the Alps. In this latest report JACCARD also makes extensive use of his generic coefficient (*coefficient générique;* C.g.), that is,

$$\frac{\text{No. of genera} \times 100}{\text{No. of species}} = \text{C.g.},$$

with instructive results. This coefficient is shown by studies of both alpine and dune floras to vary inversely with the variety of ecological conditions in the areas compared, and hence in alpine areas the value of C.g. increases with altitude, while in some dune areas of Belgium, the C.g. is greatest (100) under the excessive and narrow ecological limits of the moving dunes, and least (73) under the more varied ecological conditions of the pannes.

These analyses lead the author to the following among other conclusions: (1) The distribution of plants (at least in the alpine zone) is a resultant of the combined action of three orders of factors; (*a*) ecological, (*b*) biological, or degree of adaptation, and (*c*) sociological, or competition between species; and (2) the action of these factors has resulted in (*a*) an eliminative selection of species, and (*b*) a distributive selection determining the number of individuals and the nature of associated species.—GEO. D. FULLER.

Tetraspore formation in Nitophyllum.—Since it has been shown that in *Polysiphonia* and *Dictyota* the reduction of chromosomes occurs during the formation of tetraspores from the tetraspore mother cell, it is natural to inquire what cytological conditions obtain during tetraspore formation in those red algae which have multinucleate cells. One might guess that the tetraspore mother cell is uninucleate, or that it is multinucleate and all the nuclei except one disorganize. Soon after YAMANOUCHI's paper on *Polysiphonia* appeared, SVEDELIUS examined *Martensia*, one of the Delesseriaceae. The tetraspore mother cell is multinucleate and, as the cell enlarges, the nuclei multiply until there are about fifty. Then all but one disorganize, and four tetraspores are formed. The fixing did not allow a detailed cytological study. Recently, however, SVEDELIUS[12] secured well fixed material of *Nitophyllum punctatum*, a member of the same family, and succeeded in working out the cytological situation. The thallus is prevailingly one cell thick, but when tetraspores are so formed, it becomes three or four cells thick. The tetraspore mother

[11] JACCARD, P., Étude comparative de la distribution florale dans quelques formations terrestres et aquatiques. Rev. Gén. Botanique **26**:5–21, 49–78. 1914.

[12] SVEDELIUS, N., Über die Tetradenteilung in den vielkernigen Tetrasporangiumanlagen bei *Nitophyllum punctatum*. Ber. Deutsch. Bot. Gesells. **32**:48–57. *pl. 1.* 1914.